



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/614,854	07/08/2003	Rand Kalani Ray	HYD 012 PA	9149
29673	7590	11/17/2005	EXAMINER	
STEVENS & SHOWALTER LLP 7019 CORPORATE WAY DAYTON, OH 45459-4238			CAVALLARI, DANIEL J	
			ART UNIT	PAPER NUMBER
			2836	

DATE MAILED: 11/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/614,854	<b>Applicant(s)</b> RAY, RAND KALANI	
	<b>Examiner</b> Daniel J. Cavallari	<b>Art Unit</b> 2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 08 July 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 July 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 10/8/2003.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Information Disclosure Statement***

The information disclosure statement (IDS) submitted on 10/8/2003 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

### ***Specification***

The disclosure is objected to because of the following informalities:

- The specification contains a reference number (64) which is not found in the drawings making it unclear how the reference number (64), process controller, is incorporated into the invention (See Page 5 of Specification)

Appropriate correction is required.

### ***Drawings***

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description:

- The specification contains a reference number (64) which is not found in the drawings

Appropriate correction is required.

***Claim Objections***

Claim 15 is objected to because of the following informalities:

Claim 15 recites the limitation of "an integrated power converter" however it is unclear what the limitation "integrated" is in reference with. The claim will be examined as best understood to mean "a power converter".

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 5 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a sensor converter that turns on and off an opto-isolator switch, does not reasonably provide enablement for converting from a DC output to an AC output. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make or use the invention commensurate in scope with these claims.

Figure 3 discloses the a DC sensor input (66) connected to an opto-isolator triac (62) for switching on and off the triac. The triac only possesses the ability to turn on and off and does not possess the ability to convert DC power to an AC output. Therefore, the claim will be examined as best understood in which the limitation is as taught in the specification and drawing to mean "wherein said sensor converter operates a switch".

Art Unit: 2836

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 8 & 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "generally" in claims 8 and 19 is a relative term which renders the claim indefinite. The term "generally" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The claim will be examined as best understood to mean "extending in a direction".

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuoka et al. (US 5,001,358) and Pai et al. (US 2003/0043596).

Art Unit: 2836

In regard to Claims 1-4

Matsuoka et al. teaches:

- A first cable portion with first sensor leads (INO & COM) (See Figure 5)
- A second cable portion comprising second power supply leads located between components (N & P) and second sensor leads read on by the connection between components (25 and 23) (See Figure 5)
- A power converter, read on by the circuitry between (IND, COM) and component (25) enveloped in a shroud, read on by housing (36) (See Figure 5 & 7 and Column 4, Lines 33-47)

Matsuoka et al. teaches a power converter (27) but fails to teach a power converter converting power from a first power supply to a form for a sensor. Pai et al. teaches an AC to DC power converter comprising an AC source which is converted into DC power by a power switching supply (506) as well as a battery backup supply (See Figure 4 & 4a). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the AC to DC converter taught by Pai et al. into the adapter circuit of Matsuoka et al. by replacing the battery input of Matsuoka et al. with a first input supply (501, 502) (See Figure 3) and connecting the the DC outputs (504 and 505) with the battery connection (N & P). the motivation would have been to power the device with an available AC power supply thereby reducing the need to change the batteries.

Pai et al. has taught first power supply leads (Figure 3, 501 & 502) to converter a power form for powering the sensor of Matsuoka et al. (Figure 5, 21).

In regard to Claim 5

- The sensor converter operating a switch, read on by the opto-isolator (25) (See Figure 5)

In regard to Claims 8 & 9

Matsuoka et al. teaches a shroud, read on by housing (56) (See Figure 7 & Column 4, Lines 33-47) which is rectangular in shape but fails to disclose a cylindrical member including tapered ends and a diameter which is less than 1 inch.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the shape of the housing to be cylindrical with tapered ends and a diameter less than 1 inch since it has been held that changes in size or proportions and shape is obvious In *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984) and In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

The motivation would have been to satisfy the technical design of the housing structure with consideration for the environment of its use thereby creating a shape to meet its functionality.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuoka et al., Pai et al., and Fletcher et al. (US 2001/0035815 A1)

Incorporating all arguments above, Matsuoka et al. teaches an opto-isolator, read on by the photo-coupler (25) (See Column 3, Lines 40-43) but fails to teach explicitly teach an opto-isolator triac. Fletcher et al. teaches the use of a opto-isolator with a triac output. It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the opto-isolator triac in place of the photo-coupler taught by Matsuoka et al. The motivation would have been to take advantage of the opto-isolator triac's reduced rf interference (See Paragraph 21).

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuoka et al., Pai et al., and Alderman et al. (US 6,137,351)

Incorporating all arguments above, Matsuoka et al. teaches a sensor connection (OV, COM, & INO) (See Figure 5) but fails to teach a sensor output including a current sinking and sourcing output. Alderman et al. teaches a universal current sinking and current sourcing interface (See Abstract & Figure 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the sinking and sourcing interface taught by Alderman et al. into the sensor output of Matsuoka et al. the motivation would have been to provide for multiple types of sensors to be connected with the device.



Art Unit: 2836

Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuoka et al., Pai et al., and McNair et al. (US 4,888,494)

Incorporating all arguments above, Matsuoka et al. teaches a housing for a power converter unit (20) (See Figure 7 & Column 4, Lines 33-47) but fails to explicitly teach the circuitry mounted on a printed circuit board and encased in an epoxy potting material (See Column 1, Lines 26-31).

McNair et al. teaches circuitry printed on a printed circuit board encased in epoxy. It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the epoxy encased printed circuit board taught by McNair et al. into the housing taught by Matsuoka et al. The motivation of a printed circuit board would have been to create an easier manufacturing process than connecting the electrical components via separate wires. The motivation to encompass the circuitry with epoxy would be to prevent the connected wires from separating. (See Marler US 5,869,907, Column 6, Lines 17-61).

Claims 13 & 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuoka et al., Pai et al., and McLachlan et al. (US 2004/0129578 A1)

Incorporating all arguments above, Matsuoka et al. teaches a housing for a power converter and wires but fails to teach including a PVC over mold material surrounding the potting material.

Art Unit: 2836

McLachlan et al. teaches surrounding a wire with a potting material and PWV insulating jacket, such as a PVC tube (See Paragraph 55).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Matsuoka et al. incorporating the PVC which overlaps the potting encased wires as taught McLachlan et al. The motivation would have been to further protect the wires from fluid contact.

Claims 15, 17, & 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuoka et al., Pai et al., and McNair et al.

Matsuoka et al. teaches:

- A first cable portion with first sensor leads (INO & COM) (See Figure 5)
- A second cable portion comprising second power supply leads located between components (N & P) and second sensor leads read on by the connection between components (25 and 23) (See Figure 5)
- A power converter, read on by the circuitry between (IND, COM) and component (25) enveloped in a shroud, read on by housing (36) (See Figure 5 & 7 and Column 4, Lines 33-47)

Matsuoka et al. teaches a power converter (27) but fails to teach a power converter converting power from a first power supply to a form for a sensor. Pai et al. teaches an AC to DC power converter comprising an AC source which is converted into Dc power by a power switching supply (506) as well as a battery backup supply (See

Figure 4 & 4a). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the AC to DC converter taught by Pai et al. into the adapter circuit of Matsuoka et al. by replacing the battery input of Matsuoka et al. with a first input supply (501, 502) (See Figure 3) and connecting the DC outputs (504 and 505) with the battery connection (N & P). the motivation would have been to power the device with an available AC power supply thereby reducing the need to change the batteries.

Pai et al. has taught first power supply leads (Figure 3, 501 & 502) to convert a power form for powering the sensor of Matsuoka et al. (Figure 5, 21).

Incorporating all arguments above, Matsuoka et al. teaches a housing for a power converter unit (20) (See Figure 7 & Column 4, Lines 33-47) but fails to explicitly teach the circuitry mounted on a printed circuit board and encased in an epoxy potting material (See Column 1, Lines 26-31).

McNair et al. teaches circuitry printed on a printed circuit board encased in epoxy. It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the epoxy encased printed circuit board taught by McNair et al. into the housing taught by Matsuoka et al. The motivation for a printed circuit board would have been to create an easier manufacturing process than connecting the electrical components via separate wires. The motivation to encompass the circuitry with epoxy would be to prevent the connected wires from separating over time (See Marler US 5,869,907, Column 6, Lines 17-61).

In regard to Claim 19

Matsuoka et al. teaches a shroud, read on by housing (56) which is longer than it is wide, (See Figure 7 & Column 4, Lines 33-47) rectangular in shape but fails to disclose a cylindrical cross section with a length greater than the lateral dimension.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the shape of the housing to be cylindrical with a length greater than its width since it has been held that changes in size or proportions as well as shape is obvious In *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984) and In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

The motivation would have been to satisfy the technical design of the housing structure with consideration for the environment of its use thereby creating a shape to meet its functionality.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuoka et al., Pai et al., McNair et al., and Alderman et al.

Incorporating all arguments above, Matsuoka et al. teaches a sensor connection (OV, COM, & INO) (See Figure 5) along with a a closed connection between the sensor leads, read on by the opto-isolator switch (25) but fails to teach a sensor output including a current sinking and sourcing output. Alderman et al. teaches a universal

Art Unit: 2836

current sinking and current sourcing interface (See Abstract & Figure 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the sinking and sourcing interface taught by Alerdman et al. into the sensor output of Matsuoka et al. The motivation would have been to provide for multiple types of sensors to be connected with the device.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuoka et al., Pai et al., and McNair et al., and McLachlan et al.

Incorporating all arguments above, Matsuoka et al. teaches a housing for a power converter and wires but fails to teach including a PVC over mold material surrounding the potting material.

McLachlan et al. teaches surrounding a wire with a potting material and PWV insulating jacket, such as a PVC tube (See Paragraph 55).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Matsuoka et al. incorporating the PVC which overlaps the potting encased wires as taught McLachlan et al. The motivation would have been to further protect the wires from fluid contact.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Gillespie et al. (US 6,481,939) teaches a toll incorporating a sensor connection circuit (See Figure 2) which comprises power and sensor signal converters (See Figure 3)
- Olivier et al. (US 2004/0008579 A1) teaches an underwater cable arrangement incorporating power and sensor converters (See Figures 33 and 34)
- Rouquette (US 2003/0117025 A1) teaches an underwater cable comprising sensors, power converters, and data cables.
- Francisco, Jr, et al. (US 5,555,876) teaches sensor and power circuitry incorporating power and sensor converters (See Figure 7)

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J. Cavallari whose telephone number is (571)272-8541. The examiner can normally be reached on Monday-Friday 8:30-5:00.

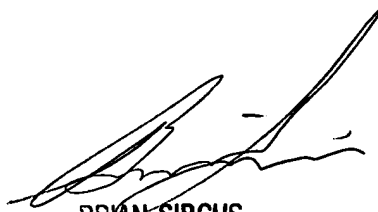
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on (571)272-2800 x36. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2836

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DJC

November 14, 2005



**BRIAN SIRCUS**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2800**